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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,217	10/24/2003	John Briar	27-035.D1	2274

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EXAMINER	
OWENS, DOUGLAS W	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/693,217	BRIAR, JOHN	
	Examiner	Art Unit	
	Douglas W Owens	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 12-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 12-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 10/24/03;03/18/04 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the flat bottom surface of the heat sink that extends past the IC by a second distance, the second distance being less than the first distance, as required in claims 14 and 19 must be shown or the features canceled from the claims.

The structure of geometric dimensions that are equal to the dimension of the substrate but whereby said structure does not have heat dissipating characteristics of a typical heatsink, as required in claim 21 must be shown or the feature canceled from the claim.

The four planar spacers that separate the heatsink from the substrate by a measurable amount, as required in claim 16 must be shown or the feature canceled from the claim.

The third distance that is greater than two of the first distances, as required in claim 17 must be shown or the feature canceled from the claim.

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: on pate 5, about line 18, "while a upper" should be replaced with "while an upper".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 14, 17, 18, 19 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 14, the requirement that the flat bottom of the heat sink extends past the IC by a second distance, perpendicular to the first distance and/or less than the first distance is not described in the specification.

Regarding claim 17, the claim requires that the third distance be greater than two of the first distances. This limitation is not described in the specification.

Regarding claim 19, there is no disclosure of a flat bottom surface that extends past the IC by a second distance, wherein the second distance is less than the first distance.

Regarding claim 21, there is no disclosure of a structure that replaces the heatsink and does not have the heat dissipating characteristics of a typical heatsink.

5. Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim requires that a structure be used in place of the heatsink, wherein the structure does not have heat dissipating characteristics of a typical heatsink. The structure considered for replacing the heatsink has not been disclosed in the specification. One having ordinary skill in the art would have been required to exercise undue experimentation to find the structure and material contemplated for use in making the device.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 14, 15, 17, 18 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, the scope of the claim is not clear. The claim recites the limitation, "the flat bottom surface of said heat sink extends past said Integrated Circuit device by a second distance, the second distance is less than the first distance..." in lines 3 – 5 and lines 9 – 11. It is not clear if the second occurrence of this limitation is merely a repetition of the first or if this is a separate feature.

Claim 15 recites the limitations of "...an upper surface..." and "...a lower surface..." Claim 12 draws reference to a flat upper surface and a lower surface. It is not clear if the upper and lower surface mentioned in claim 15 are the same surfaces mentioned in claim 12, or if they are different surfaces.

Claim 17 recites the limitation, "...the third distance greater than two of the first distances..." The scope of the claim is vague because it is not clear if the third distance is greater than the sum of the first distances or each of the two first distances individually.

Claim 21 requires that the heatsink be replaced with a structure that does not have heat dissipating characteristics of a typical heatsink. The scope of the claim is vague, since it is not known what structure can be used in place of the heatsink.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 12, 13, 15, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,720,650 to Miyazaki in view of admitted prior art.

Regarding claim 12, Miyazaki teaches an IC package structure (Fig. 2E, for example), comprising:

an IC device (2) having a top and bottom surface, with electrical contact points (connected at solder ball (3)) mounted in the bottom surface of the IC;

a heatsink (7a; Col. 5, lines 16 – 29)for the IC having a flat bottom surface extending past the IC device by a first distance, the flat bottom surface contacting the top surface of the IC device;

a substrate (1) having a flat upper surface and a lower surface, the flat upper surface and lower surface extending past the IC device by the first distance;

a molding compound (4, 6) between the flat bottom surface of the heatsink and the flat upper surface of the substrate to fill only the first distance, said molding compound among the points of electrical contact to the IC device.

Miyazaki does not teach an IC package structure, wherein the lower surface has points of electrical contact. Admitted prior art teaches an IC package structure, wherein the lower surface has points of electrical contact. It would have been obvious to one having ordinary skill in the art to incorporate the teaching of admitted prior art into the device taught by Miyazaki, since it is desirable to connect the IC device and wiring substrate to external devices.

Regarding claim 13, Miyazaki teaches an IC package structure, wherein the IC device is a ball grid array.

Regarding claim 15, Miyasaki teaches an IC package, wherein the substrate comprises:

an upper surface;

electrical contact points in the upper surface, forming substrate contact points (connected to contact (5), and the solder ball (3)), provided to make electrical connection with contact points of the IC devices; and

a network of interconnect lines that interconnects the upper and lower surface (inherent feature of a wiring substrate).

Miyazaki does not teach electrical contact points in the lower surface. Admitted prior art teaches electrical contact points in the lower surface. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of admitted prior art into the device taught by Miyazaki for reasons discussed above.

Regarding claim 16, Miyazaki teaches an IC package device, wherein contact points of the IC device make electrical contact with the substrate upper surface contact points, while the top surface of the IC device makes contact with the heatsink. Miyazaki does not teach four spacers that separate the substrate from the heatsink. Admitted prior art teaches spacers (14) that separate the substrate from the heatsink. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of admitted prior art into the device taught by Miyazaki, since it is desirable to maintain the design spacing between the substrate and heat sink. It

would have been further obvious to use four spacers since it is desirable to keep consistent spacing.

Regarding claim 20, Miyasaki does not teach that the molding material is cured by UV light. This is considered a product-by-process limitation. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

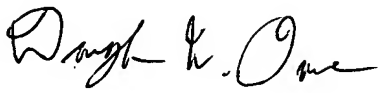
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Douglas W Owens
Examiner
Art Unit 2811